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Editorial

Introduction to the special issue: Reduced-impact logging for climate change mitigation (RIL-C)

"Reduced-impact logging (RIL)," a phrase used in over 5000 articles since it was coined 25 years ago (Putz and Pinard, 1993), is often heralded as a way to balance environmental protection with timber production in selectively logged forests in the tropics. Despite this enthusiasm, RIL adoption remains limited for several familiar reasons, such as high cost, poor transparency; and lack of incentive mechanisms, training, and pressure from environmental groups (Putz et al., 2000). In this special issue, we address a related, but hitherto poorly recognized barrier to RIL: the previous lack of a widely accepted, outcome-based standard for evaluating RIL performance. In the absence of this standard, there was a cacophony of RIL claims with no ability to justify, measure, or compare them.

In this special issue we build upon previous work (Griscom et al., 2014) to develop a set of improved practices and related measures referred to collectively as Reduced-Impact Logging for Climate Change Mitigation (RIL-C), with emphasis on the "C" to denote the additional carbon stored in managed forests. With RIL-C, the authors' shared goal is to promote more environmentally sound tropical forestry that is also economically viable over the long term by focusing on climate-effective RIL outcomes that can be measured inexpensively and consistently.

In 2016, The Nature Conservancy and partners published a methodology for measuring and validating RIL-C outcomes (The Nature Conservancy and TerraCarbon LLC, 2016); in 2018, this methodology was recommended for making carbon claims as part of the Forest Stewardship Council's Ecosystem Services Procedure (FSC-ES, Forest Stewardship Council, 2018). The methods used by the authors in this issue are consistent with these standards, thereby providing means for credible justification of RIL-C claims across multiple geographies. Data were collected in 56 forest management enterprises in selectively logged forests of 7 tropical countries using a consistent field-based measurement system. This system is designed to comprehensively measure logging disturbances and set a baseline against which impact reductions can be evaluated.

Our emphasis on carbon is intended to motivate uptake of the broader suite of RIL interventions; we have no intention to undermine the important non-carbon benefits that RIL delivers. More work is needed to develop outcome-based systems for RIL benefits to worker safety, financial profitability, water quality, biodiversity, and soil health. In the meantime, carbon is presently the only ecosystem service with a transparent and consistent system for measuring, monitoring, reporting, verifying, and validating RIL performance (RIL-C MRV). To measure and compare selective logging emissions across the tropics, we employ a Carbon Impact Factor (CIF), which expresses collateral damage emissions relative to the carbon in extracted timber (Feldpausch et al., 2005). By including mass on both sides of the ratio, CIF adjusts for regional variation in wood density and harvest intensity so as to inform efforts to improve forest management in ways that maintain timber supplies.

A RIL-C MRV system can overcome some barriers to RIL uptake, but it does not directly address the primary problem of lack of effective incentives. Nevertheless, we believe that the science necessary to operationalize RIL-C MRV systems can also be used to quantify climate mitigation opportunities, and that knowledge of these opportunities can motivate stakeholders to incentivize action to satisfy regional climate commitments. Specifically, we believe that if decision-makers responsible for jurisdictional initiatives are made aware of the cost-effective carbon savings from RIL-C best practices they will activate instruments to operationalize them.

It is too early to tell if climate-based incentives will result in sustained improvements in tropical forest management, but promising signals are emerging. In East Kalimantan, Indonesia for example, one logging concession recently demonstrated emissions 50% below the regional baseline and certified their claim using the RIL-C methodology (Ichwan, 2018). Other countries (e.g. Mexico, the Republic of Congo, and Democratic Republic of Congo) are considering jurisdictional RIL-C initiatives. Suriname recently included RIL-C in its Forest Reference Emissions Level submitted to the United Nations (Government of Suriname, 2018). Other incentive mechanisms such as FSC-ES, the World Bank Forest Carbon Partnership Facility (FCPF), the Green Climate Fund, private sector supply chain commitments, the voluntary carbon market, and various hybrid approaches provide additional opportunities to capture the carbon benefits of RIL-C practices. And finally, in countries such as Gabon, RIL-C is being considered as a mechanism to demonstrate performance as a large portion of its Nationally Determined Contribution to the Paris Agreement (NDC). Indeed, the research presented in this special issue indicates that at least 9 tropical countries could deliver more than 50% of their NDC commitments through deployment of RIL-C alone.

Given this landscape of opportunities, there is utility in providing accurate baseline estimates of carbon emissions from selective logging, establishing feasible RIL-C targets, and incentivizing RIL-C practices that allow forest managers to reach production targets while reducing carbon emissions. The articles in this special issue represent a collective effort to move towards these applied science goals at both regional and pan-tropical scales. In the first five articles, we present selective logging emissions data from forest management enterprises in East Kalimantan Province in Indonesia, the Congo Basin (Democratic Republic of Congo, Gabon, and Republic of the Congo), Madre de Dios Department in Peru, Suriname, and three Mexican states on the Yucatan Peninsula. Each analysis considers regionalized emission reduction benefits available from adoption of RIL-C practices. In the final paper, we synthesize these data to draw conclusions, estimate pan-tropical logging emissions, set a pan-tropical RIL-C target, and highlight the most promising RIL-C practices for achieving that target.

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While adoption of RIL in general and RIL-C in particular will increase the sustainability of timber yields by reducing stand damage and increasing post-logging rates of timber stock recovery (Roopsind et al., 2018), we acknowledge that additional silvicultural treatments are often necessary. Similar to RIL research, much has been said on this important subject, but very little seems to have improved the situation on the ground (Putz, 2017). Neither RIL nor RIL-C will solve the sustainability problem, but we hope that increased scrutiny provided by outcome-based systems like RIL-C will encourage efforts to ensure that harvest intensities and intervals are supported by science. Although we do not directly address the relationship between RIL and sustainability in this issue, we are happy to see RIL-C performance metrics integrated into independent standards to ensure sustainability, such as FSC-ES.

Our generation faces enormous challenges if we are to meet increasing demands for wood and carbon storage. If we continue to harvest timber from tropical forests unsustainably and destructively, we will spend down our natural capital and reduce opportunities to meet the challenges of the future. We hope that RIL-C contributes to an alternative vision where humans, forestry, and forest ecosystems can thrive in synergy.

References

Feldpausch, T.R., Jirka, S., Passos, C.A.M., Jasper, F., Riha, S.J., 2005. When big trees fall: Damage and carbon export by reduced impact logging in southern Amazonia. For. Ecol. Manage. 219, 199–215. https://doi.org/10.1016/j.foreco.2005.09.003.

Forest Stewardship Council, 2018. Ecosystem Services Procedure: Impact Demonstration and Market Tools [WWW Document]. FSC-PRO-30-006 V1-0. URL https://ic.fsc.org/en/document-center/id/328 (accessed 10.22.18).

Government of Suriname, 2018. Forest Reference Emission Level for Suriname's REDD+ Programme. Paramaribo, Suriname.

Griscom, B.W., Ellis, P.W., Putz, F.E., 2014. Carbon emissions performance of commercial logging in East Kalimantan, Indonesia. Glob. Chang. Biol. 20, 923–937. https://doi.org/10.1111/gcb.12386.

Ichwan, O.S., 2018. Metode Ril-C Tekan 50 Persen Emisi. Kompas.

Putz, F.E., 2017. Sustainable = good, better, or responsible. J. Trop. For. Sci. 30.

Putz, F.E., Dykstra, D.P., Heinrich, R., Heinricht, R., 2000. Why poor logging practices persist in the tropics. Soc. Conserv. Biol. 14, 951–956.

Putz, F.E., Pinard, M.A., 1993. Reduced-impact logging as a carbon-offset method. Conserv. Biol. 7, 755–757. https://doi.org/10.1046/j.1523-1739.1993.7407551.x.

Roopsind, A., Caughlin, T.T., van der Hout, P., Arets, E., Putz, F.E., 2018. Trade-offs between carbon stocks and timber recovery in tropical forests are mediated by logging intensity. Glob. Chang. Biol. https://doi.org/10.1111/gcb.14155.

The Nature Conservancy, TerraCarbon LLC, 2016. Methodology for improved forest management through reducted impact logging (RIL-C) [WWW Document]. VM0035. URL https://verra.org/methodology/vm0035-methodology-for-improved-forest-management-through-reduced-impact-logging-v1-0/ (accessed 10.22.18).

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